second chamber, said pinhole aperture being provided in said wall, at least part of said focusing means being mounted on said wall.

26. Apparatus in accordance with claim 23, wherein said capillary tube receives only a portion of the available liquid to be analyzed, means being provided for diverting the remaining portion of said liquid.

27. Apparatus in accordance with claim 23, wherein said gas contained in said first chamber consists entirely of the vapor of the liquid to be analyzed.

28. Apparatus in accordance with claim 23, wherein means for admitting gas other than vapor of the liquid to be analyzed is connected to said first chamber.

29. Apparatus in accordance with claim 23, wherein a separating wall is provided between said first chamber and said second chamber, said pinhole aperture being mounted on said separating wall.

30. Apparatus in accordance with claim 23, wherein a pressure relief valve is provided on said first chamber, said pressure relief valve leading to the atmosphere.

31. Apparatus in accordance with claim 23, wherein a pressure relief valve is provided on said first chamber, said pressure relief valve being connected to a vacuum source for withdrawing gas from said first chamber and maintaining same at a predetermined absolute pressure.

32. Apparatus in accordance with claim 23, wherein a pressure relief valve is provided on said first chamber, said pressure relief valve maintaining the pressure in said first chamber between 100 torr and 10 atmospheres.

33. Apparatus in accordance with claim 23, wherein said gas contained in said first chamber is at substantialy atmospheric pressure.

34. Apparatus in accordance with claim 23, wherein heating means is provided for said first chamber whereby rapid evaporation of the charged droplets in said first chamber is facilitated.

35. Apparatus in accordance with claim 23, wherein means for maintaining the interior wall defining said first chamber at a low electrical potential whereby the energy of said ions when they are received by said mass-to-charge analyzer is established by the low potential of said first chamber.

36. Apparatus in accordance with claim 23, in combination with a mass-to-charge analyzer which receives ions focused by said focusing means, said mass-to-charge analyzer being a quadrupole mass filter.

37. Apparatus in accordance with claim 36, wherein a third chamber is provided adjacent said second chamber with a further aperture provided between said second chamber and said third chamber, said quadrupole mass filter being arranged in said third chamber, means for maintaining a vacuum in said third chamber higher than the vacuum being maintained in said second chamber.

38. Apparatus in accordance with claim 23, in combination with a mass-to-charge analyzer which receives ions focused by said focusing means, said analyzer being a magnetic ion mass spectrometer.

39. Apparatus in accordance with claim 23, wherein said focusing means includes a system of lenses, at least one of said lenses comprising a transparent mesh which permits neutral molecules flowing from said first chamber to said second chamber to be separated from said ions flowing from said first chamber to said second chamber.

40. Apparatus in accordance with claim 39, wherein means for maintaining at least one of said lenses at a high electrical potential is provided, said potential being sufficiently high that it causes ions influenced by said lenses to be accelerated sufficiently to break them into fragment ions as they collide with neutral molecules in the same flow from said small chamber, further means being provided in said focusing means for decelerating said fragment ions before they are received by said mass-to-charge analyzer.

41. Apparatus in accordance with claim 23, in combination with a mass-to-charge analyzer, said mass-to-charge analyzer being received in said second chamber.

42. Apparatus in accordance with claim 23, wherein an electron gun is provided in said second chamber for selectively electron-impact ionizing neutral molecules emerging from said first said chamber.

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